Hydraulic Even Flat Spray Nozzles with Large Turndown* Ratio

VVEP-HL series:

- Maintains even distribution while minimizing variation in spray angle even when spray pressure is changed.
- Effective particularly for small spray flow control at low pressures.

Having a large turndown ratio of spray flow-rate, VVEP-HL series is optimal for applications where spray capacity needs to be changed depending on the spray target and applications.

*Spray flow-rate adjustable range

Applications

■ Cooling:
  - Steel plate, cast steel, cast metal, extruded aluminum

■ Cleaning:
  - Steel plate cleaning after pickling

■ Applications which require a large turndown ratio

Ideal for hydraulic spray cooling which requires changing of spray capacity, especially for upper zone and under molding of continuous casting machines, and for control cooling.

Comparison with conventional nozzle

**Conventional flat spray nozzle**

**VVP series**

- Low pressure, small spray flow

**Large turndown nozzle**

**VVEP-HL series**

- Low pressure, small spray flow

Optimized spray nozzle and alignment

VVEP-HL nozzles, arranged with appropriate nozzle spacing, can achieve uniform cooling and cleaning with wide spray flow range, as VVEP-HL minimizes spray angle variation due to pressure changes.

Spray angle variation is minimal even if spray capacity is decreased to 1/5.

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**Spray flow-range adjustable range**

At regular pressure

At low pressure

Spray angle narrows

Spray flow and impact distribution deteriorate

Causes spray gaps!

No gaps!
【Relation of pressure and spray angle】

Spray capacity: 23 L/min (at 0.3 MPa)

Pressure (MPa)

0.7
0.6
0.5
0.4
0.3
0.2
0.1
0

Spray angle (°)

80
90
100
110
120

Large turndown ratio nozzle
(Model: VVP100230HL)

Standard flat spray nozzle
(Model: VVP115230)

Spray angle variation range of standard flat spray nozzle at 0.02–0.7 MPa

Spray angle variation range of large turndown ratio nozzle at 0.02–0.7 MPa

【Interference in spray impact due to pressure changes】

[Spray impact]

Higher pressure
Larger spray capacity

Lower pressure
Smaller spray capacity

【Drawing of 3/8F VVEP 100 230 HL S303】

Pipe conn. size Rc3/8

① Nozzle body ② Sleeve

Material: Stainless steel 303

【Spray performance】

<table>
<thead>
<tr>
<th>Pipe conn. size</th>
<th>Spray capacity code</th>
<th>Spray capacity (L/min) at various pressures</th>
<th>Free passage diameter (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rc1/4</td>
<td>30</td>
<td>0.2 MPa: 0.9 0.1 MPa: 1.8 0.3 MPa: 3 0.5 MPa: 3.9 0.7 MPa: 4.5</td>
<td>2.3</td>
</tr>
<tr>
<td>Rc3/8</td>
<td>230</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rc1*1/4</td>
<td>1240</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example) 1/4F VVEP 10030 HL S303

Pipe conn. size: 1/4F

Spray capacity code: 30

Example: 1/4F VVEP 100 30 HL S303

“M" indicates male thread ("R" of the ISO standard) and "F" indicates female thread ("Rc" of the ISO standard).

If you need a custom-made nozzle, please inform us of detailed specifications including 1) spray flow range you desire, 2) your current nozzle arrangement, and 3) spray height.

【How to order】

Please inquire or order for a specific nozzle using this coding system.

Example) 1/4F VVEP 100 30 HL S303

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